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The Comparison Factor in the Evaluation of Examination Papers

A STUDY OF THE COMPARISON FACTOR IN THE EVALUATION OF SUBJECTIVE TYPE OF EXAMINATION PAPERS AND ITS BEARING ON HIGH SCHOOL AND COLLEGE MEASUREMENT

Walter O. Shriner
Head, Department of Mathematics
Indiana State Teachers College

PART I
Introduction

This study was made for the purpose of answering the question, "What influence does the existence of a large number of student papers have on the reliability of a teacher's marks in the grading of the ordinary subjective type of written examination?"

During the past twenty years a great deal of research has been undertaken and many convincing arguments supported by statistical evidence have been advanced to show that teachers are incapable of evaluating the old type subjective examination papers with anything like a high degree of accuracy. Among the first and best known of these studies were three made by Starch and Elliott.[1] In the first of these studies they procured two English papers written by two high school students on a final examination. Facsimile reproductions were made and sent out to each of the high schools included in the North Central Association of Colleges and Secondary Schools with the request that the papers be marked by the principal teacher of English on the scale of one hundred per cent. The result of 195 gradings returned showed a wide variation in marks (from twenty-five to forty) for the same paper. To answer the question as to whether or not these findings would be the same in other subjects, these men conducted similar experiments in geometry and history, using one final examination paper in each, respectively. As a result of their studies, Starch and Elliott drew the following familiar conclusions: (1) " . . . marks assigned to the same paper by different teachers vary enormously," (2) "The variability or unreliability of marks is as great in one subject as in another," (3) "The immense variability of marks tends obviously to cast considerable discredit upon the fairness and accuracy of our present methods of evaluating the quality of work in school."

The evidence produced by these and similar studies has had so much influence upon present educational measurement thought that the use of the traditional type of examination is universally

[1] School Review 20: 442-57; 21: 254-59; 26: 676-81.

looked upon with suspicion. This is more or less evident from the weight given these studies in the widely used texts on educational tests and measurements by such authors as Monroe-DeVoss-Kelly, Smith-Wright, Kelly, Ruch, and Paulu.

The outstanding limitations of this combined study of Starch and Elliott in the drawing of any general conclusions are:

(1) Only one paper was used for the investigations in the case of geometry and history, respectively, and two papers in the case of English. Under normal classroom conditions, from twenty to thirty papers usually on the same examination are graded at the time, and it is quite probable that this "comparison factor" plays an important part in determining the reliability of the marks given.

(2) Only the leading or principal teacher of the subject in a given high school was asked to submit a grade. In order to draw general conclusions the work of teachers of various lengths of service and degrees of skill should be considered.

Some time ago, Dr. Ben D. Wood[2] of the Institute of Educational Research, Teachers College, Columbia University, made a study of the reliability of markings on college entrance board examination papers in algebra and geometry. In this investigation 413 algebra papers and 396 geometry papers were each scored twice by different readers. All of the readers had received the same general instructions as to the credits and standards to be applied, and had been working together several days under the supervision of vigilant chiefs who were anxious to secure uniformity in the marking. However, the grading and regrading of the papers involved in this study were made in total independence of each other.

The results showed that the correlation coefficients as determined by the Pearson formula were very high. For algebra this reliability coefficient was: r equals .986 (n equals 413); and for geometry it was: r equals .956 (n equals 396).

The conclusions drawn by Dr. Wood were to the effect that under the conditions given above, the reliability of the first markings was so high as to make rereading a waste of time, energy, and money.

The fact that in this study the readers were especially trained for the work and the conditions controlled as to the weighting of the elements and the scores to be assigned, makes a universal application of these conclusions impossible.

Present Study Program

It was deemed advisable in the conduct of this study to carry the investigation into two high school departments under as normal conditions as posisble. Twenty-five semester final examination papers were procured from each of two classes in sophomore algebra and freshman English, respectively. These classes were composed of unselected pupils in the Ann Arbor (Michigan) High School where the pupils were not classified on the basis of intelligence scores or achievement records. There were exactly twenty-five pupils in the algebra class while there were twenty-seven in English. Two of the English papers were selected at random and discarded merely for the purpose of making statistical computation more simple.

The algebra examination consisted of nine problems or elements of various degrees of difficulty. The attention of the reader is also called to the fact that the writing of a business letter and a theme of not less than seventy-five words as a part of the English examination makes it decidedly one of the so-called subjective type.

The sets of original papers (written in blue books) in all cases were sent out consecutively either to teachers of varied lengths of experience and degrees of skill or to advanced college students preparing to teach in those respective subjects. Absolutely no instructions were given as to how the different elements were to be weighted or scored. In the reading of the papers all teachers were cautioned to make no corrections on the original manuscripts so as to avoid influencing the marks of a subsequent reader. In submitting their reports, all teachers were requested not only to give the marks in terms of per cent on the scale of 100, but also to designate what they considered to be the passing mark. The importance of grading the papers and of filling out the especially prepared report sheets in-

[2]Report of College Entrance Examination Board, 1921.

dependently of any other teacher was stressed.

To date, the independent marks of twenty-five teachers or prospective teachers of English and a like number for algebra have been obtained from various sections of Ohio, Michigan, and Indiana. This represents a total of twelve hundred and fifty paper readings which number is deemed quite sufficient for the drawing of general conclusions.

It might be claimed that under stress of the above experiment each individual in marking a set of the papers would give more than usual care to the evaluation. The possibility of this factor having a determining influence on the results is offset in part by the necessity of each reader having had to render her markings without correcting the original manuscripts. Again under normal classroom conditions marks are often made more accurate by a revision of those cases in which careless mistakes have been made when pupils return such papers for explanations as to penalities.

In the statistical treatment of the results, the coefficient of correlation was computed for each teacher's set of marks with the corresponding set of arithmetical means (averages) of algebra and English, respectively. In order to determine the reliability of a given teacher's marks, it was essential that the most perfect set of marks obtainable be used in that measurement. Both the arithmetical mean and median of the twenty-five marks given on each pupil paper were found and, since in all cases they proved to be approximately the same, the set of means or averages were taken as representing the "best" marks for the various papers. The reason for this choice was that the mean lends itself best to statistical computation in case the writer decided to extend the scope of this study later.

The assumption that the average scores represent the "best" set of marks obtainable for each set of papers is based on the mathematical theory of dispersion. One technique which has previously been used by the writer[3] and again by Dr. G. M. Ruch[4] in two similar studies published in 1924, was that of computing the coefficients of correlation between the various pairs of teachers' marks. This later technique results in lower correlation coefficients due to the imperfections in both sets of marks.

In computing the coefficients of correlation presented in this study a derived form of the Pearson product moment formula was used. All of the computations were checked for accuracy and it is felt that the numerical results in this connection are quite accurate.

Presentation of Results

The results of the different readings made by the twenty-five teachers on the set of sophomore algebra papers were compiled from the independent report sheets and are to be found in terms of their per cent marks in Table I together with the computed averages for each paper. Table II gives the same data with respect to the English set.

The first colum of each table gives the pupil papers for the respective sets according to alphabetical arrangements of the pupils' names. Columns A to Y, inclusive, give the per cent grades assigned to the corresponding papers by the various teachers as designated in the headings by capital letters in the order in which they evaluated the papers. The last column gives the arithmetical means for the papers in each set, respectively. As previously stated, these sets of mean grades were used as the "best" marks obtainable for the algebra and English papers.

Tables III and IV present summaries of important relationships based on the per cent marks as given in Tables I and II. The first column of Tables III and IV designates the teacher; the second column gives the number of years of teaching experience reported by the corresponding teacher; the third column gives the coefficient of correlation between the teacher's set of marks and the "best" set; the fourth column gives the probable error of the correlation coefficient; while the remaining columns give the passing grade indicated, the number of failures, per cent of failures, and the number of pupils passed by the respective teachers in the order named.

Table V consists of two sections in which the highest marks, the lowest, and

[3]Mathematics Teacher, 17: 426-43 (Novemeber, 1924).

[4]Improvement of the Written Examination, pp. 51-55, (December, 1924, Scott, Foresman and Company).

TABLE I

SUMMARY OF THE MARKS GIVEN A SET OF TWENTY-FIVE ADVANCED ALGEBRA PAPERS BY TWENTY-FIVE TEACHERS

Algebra Paper	Teacher																								Average (Best) Grade
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
No. 1	96	95	89	100	94	90	96	100	100	100	94	98	93	100	90	90	94	96	90	85	98	94	92	88	95	94.8
No. 2	77	69	59	62	44	45	70	59	60	57	58	58	81	52	47	55	71	62	45	50	51	40	48	59	57	57.4
No. 3.	98	97	94	94	94	93	94	98	96	99	96	96	94	98	96	95	96	90	95	100	98	92	91	97	98	95.6
No. 4	70	72	66	34	62	55	62	75	73	71	67	53	79	55	64	51	69	50	64	40	60	54	63	75	63	61.9
No. 5	82	89	78	60	67	67	84	74	72	71	70	81	74	68	68	75	88	69	71	72	73	75	72	91	70	74.4
No. 6	98	98	92	95	95	93	98	99	98	99	98	100	88	100	95	94	97	93	92	97	99	84	94	99	100	95.8
No. 7	62	68	65	55	56	67	65	57	60	63	61	63	63	65	69	52	62	60	67	62	55	51	53	60	62	60.9
No. 8	97	98	93	72	83	88	96	90	94	93	84	80	97	86	93	87	99	91	91	90	89	96	90	93	90	90.4
No. 9	88	88	79	75	89	83	66	76	78	76	76	76	83	66	78	71	75	73	79	70	75	80	77	92	70	77.6
No. 10	87	96	84	80	83	85	89	86	77	77	82	83	92	87	84	85	90	78	88	90	84	81	89	87	91	85.4
No. 11	72	78	74	60	78	60	64	71	74	72	77	58	79	55	67	70	78	66	72	60	72	77	78	78	77	70.7
No. 12	83	88	80	58	78	80	78	81	81	83	73	68	82	80	73	72	76	79	82	80	81	68	73	85	81	77.7
No. 13	75	81	71	75	44	65	68	64	65	62	61	75	70	70	77	59	63	65	70	68	65	63	65	82	70	67.7
No. 14	98	99	96	100	95	95	96	100	100	100	98	100	95	100	97	93	98	94	97	100	100	93	95	100	99	97.5
No. 15	55	64	56	45	50	60	50	54	54	55	54	68	59	66	50	42	50	51	54	56	54	50	50	63	53	54.5
No. 16	74	79	77	70	61	67	72	67	65	63	68	53	78	72	76	54	79	70	66	75	74	67	74	74	76	70.0
No. 17	84	80	83	65	56	60	67	75	72	70	59	65	84	71	71	65	80	61	65	60	64	66	75	76	68	69.7
No. 18	75	77	72	67	61	55	77	70	68	67	71	65	85	66	64	64	74	63	73	70	78	65	66	81	79	70.1
No. 19	80	82	87	56	56	65	84	88	90	86	76	61	92	77	75	63	82	67	76	70	71	76	76	86	82	76.2
No. 20	77	85	76	56	78	70	86	67	65	60	67	74	82	70	72	73	81	68	84	77	70	61	71	77	78	73.0
No. 21	98	99	91	98	95	93	92	96	99	99	97	98	93	100	94	92	91	95	96	95	97	91	93	96	96	95.4
No. 22	62	68	70	58	50	45	76	66	67	66	65	53	81	60	70	60	70	47	68	57	58	55	60	70	73	63.0
No. 23	55	54	50	35	22	40	48	43	45	44	37	35	51	44	37	53	47	42	48	33	52	48	57	58	44	44.9
No. 24	80	87	81	65	39	55	68	69	72	71	63	68	77	88	65	83	72	64	69	66	66	72	70	89	72	70.8
No. 25	98	100	95	90	100	95	96	96	98	97	97	96	96	97	85	91	93	87	94	100	97	95	96	98	97	95.4

the difference between the two are given for each paper of the algebra and English sets, respectively.

Conclusions

Among the outstanding facts revealed from a study of the data presented in the foregoing tables are the following:

1. The reliability of the various teachers' marks for both the algebra and English sets of papers was very high.

As shown in Table III, the marks of only three teachers correlated less than .9 with the best set and all correlations were above .85. In Table IV, all correlations were above .8, although six were below .9. The median correlation coefficients were .946 and .917, respectively, and the probable errors were comparatively small.

2. While there were too few teachers involved with any given length of experience to permit the drawing of final conclusions, the indications are that length of teaching experience is not an important factor in the reliability of marks.

Table III shows the highest correlation coefficient to be that of a prospective teacher of mathematics with no experience, while the three lowest correlations were found in the cases of teachers with experience. Similar facts are given in Table IV.

TABLE II

SUMMARY OF THE MARKS GIVEN A SET OF TWENTY-FIVE FRESHMAN ENGLISH PAPERS BY TWENTY-FIVE TEACHERS

English Paper	Teacher																									Average (Best) Grade
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
No. 1	56	70	77	76	73	75	74	65	51	67	64	65	74	80	70	70	70	67	78	77	67	76	76	60	74	70.1
No. 2	75	79	86	82	76	73	69	78	72	69	75	83	81	75	76	76	75	77	86	80	77	80	83	74	84	77.6
No. 3	56	68	71	64	65	63	66	60	64	59	60	64	71	65	71	66	58	64	77	75	56	73	73	49	66	65.0
No. 4	63	70	78	71	67	69	71	66	72	68	64	62	81	65	74	78	73	73	80	74	54	81	79	69	72	71.0
No. 5	81	84	87	84	84	82	75	83	79	85	84	80	88	80	84	85	84	86	87	88	80	81	82	73	85	82.8
No. 6	81	84	82	80	82	80	90	80	80	85	77	81	91	90	83	91	88	91	89	86	83	83	82	82	81	84.1
No. 7	83	86	89	91	82	85	94	88	86	87	91	90	96	90	91	93	93	92	95	94	91	90	90	86	87	89.6
No. 8	74	74	77	76	73	74	76	75	65	74	77	68	83	75	78	82	74	89	80	86	72	82	83	73	85	77.0
No. 9	74	74	77	76	73	74	76	75	65	74	77	68	83	75	78	82	74	89	80	86	72	82	83	73	85	77.0
No. 10	50	58	59	63	50	54	55	68	56	67	59	65	75	60	67	71	67	71	76	74	59	77	76	57	59	63.7
	81	81	90	82	81	78	73	89	88	84	81	95	89	90	89	89	89	88	88	92	80	86	85	84	86	**85.5**
No. 11	88	86	91	88	91	87	88	82	90	90	93	92	94	95	91	94	94	95	93	92	90	88	88	91	88	90.4
No. 12	68	75	74	70	80	74	73	56	70	68	59	70	84	60	75	68	68	82	69	73	60	65	65	63	77	69.8
No. 13	75	76	78	70	71	77	65	79	76	77	70	80	82	85	73	80	81	76	79	82	72	81	82	86	76	77.2
No. 14	63	70	71	65	66	62	63	73	61	65	51	79	68	65	67	72	60	71	68	77	62	83	84	50	68	67.4
No. 15	75	75	82	71	75	78	72	64	70	76	72	83	82	75	77	69	68	66	79	80	74	79	78	77	78	75.0
No. 16	50	78	69	56	51	66	52	53	51	53	40	75	72	50	57	56	50	51	64	75	39	65	65	48	60	57.8
No. 17	94	94	93	96	92	92	92	95	94	94	94	92	95	97	93	93	92	96	95	93	95	92	92	92	95	93.8
No. 18	88	80	89	80	81	83	78	84	81	91	85	92	85	85	84	88	83	90	88	86	79	85	84	82	83	84.6
No. 19	85	76	71	71	78	72	62	78	70	56	65	82	87	65	65	81	76	83	73	88	66	72	73	66	73	73.4
No. 20	74	80	81	82	86	82	77	76	73	86	67	80	85	85	84	90	87	87	83	88	77	80	80	78	82	81.3
No. 21	79	84	88	83	83	81	74	81	72	84	70	87	81	80	80	87	85	88	80	83	77	76	75	67	85	80.4
No. 22	63	68	70	67	59	60	61	65	60	68	62	75	76	70	66	77	75	79	73	74	49	71	70	61	65	67.3
No. 23	96	95	94	90	88	80	89	93	95	92	88	95	95	95	95	95	95	95	93	93	93	90	89	90	91	92.2
No. 24	85	89	86	90	83	90	86	87	81	86	83	96	91	85	89	94	90	96	90	91	86	83	85	86	90	87.9
No. 25	88	85	88	94	82	87	80	91	86	91	79	98	92	90	87	92	92	92	91	96	82	88	87	84	89	88.4

3. While the degree to which teachers can and do determine the relative value of papers within a set of twenty-five is quite high, they differ widely in determining the arbitrary standard for passing or failing pupils.

Although the correlations were found to be high which means that teachers assign marks so as to give papers their proper rank within a set, Table V shows that one teacher considered sixteen of the algebra papers as below passing standard while another limited the failures to two. In the case of the English set, the number of failures ranged from fourteen to one. This last finding brings out a very important feature of measurement. The fault does not lie in the inability of teachers to give the proper comparative values to a set of pupil papers. The entire trouble lies in the choosing of a suitable arbitrary mark to be designated as the passing grade. The frequent listing of the arbitrary 70 or 75 as the passing grade, regardless of the distribution of the marks, the difficulty of the examination, or the composition of the class membership, is quite evident from an examination of the data in Table V. However, a point that is just as important and less apt to be rec-

TABLE III

SUMMARY OF RELATIONSHIPS BASED ON THE MARKS GIVEN TWENTY-FIVE ALGEBRA PAPERS CLASSIFIED ACCORDING TO TEACHER

Teacher	Years Taught	Correlation With Set of Average Grades	Probable Error	Passing Grade Indicated	Number of Pupils Failed	Percent of Pupils Failed	Number of Pupils Passed
A	0	.946	.014	75	7	28%	18
B	5	.965	.009	70	5	20%	20
C	10	.956	.012	70	5	20%	20
D	4	.887	.029	75	16	64%	9
E	3	.901	.025	70	13	52%	12
F	5	.930	.018	70	14	56%	11
G	2	.878	.030	70	9	36%	16
H	3	.962	.010	70	9	36%	16
I	3	.952	.013	75	14	56%	11
J	1	.951	.013	70	9	36%	16
K	6	.966	.009	65	7	28%	18
L	6	.906	.024	65	8	32%	17
M	2	.867	.033	70	3	12%	22
N	4	.918	.021	75	14	56%	11
O	1	.940	.016	60	3	12%	22
P	9	.926	.019	70	11	44%	14
Q	0	.931	.018	60	2	8%	23
R	2	.957	.011	60	4	16%	21
S	2	.955	.012	60	3	12%	22
T	7	.946	.014	75	14	56%	11
U	0	.970	.008	60	5	20%	20
V	0	.940	.016	60	6	24%	19
W	7	.951	.013	60	4	16%	21
X	0	.913	.022	70	4	16%	21
Y	0	.964	.010	60	3	12%	22
Median	3+	.946	.014	67+	6	24%	19

ognized is: The difficulty in determining an arbitrary standard or passing mark is equally as great in the case of objective tests as in the case of the so-called subjective tests. This is a point that has long been overlooked in most of the discussions on the relative merits of the new and old type of tests.

Table V shows the correlation of the sets of highest and lowest marks of each group of papers with its corresponding average or "best" set to be above .94. An examination of the data in Tables I and II will reveal the fact that most of the highest marks for each set were contributed by a few teachers who were uniformly high in their grading while the lowest marks were contributed by a few teachers who were uniformly severe in their marking. This difference among teachers as to a degree of severity with which they uniformly mark papers even though giv-

TABLE IV

SUMMARY OF RELATIONSHIPS BASED ON THE MARKS GIVEN TWENTY-FIVE ENGLISH PAPERS CLASSIFIED ACCORDING TO TEACHER

Teacher	Years Taught	Correlation With Set of Average Grades	Probable Error	Passing Grade Indicated	Number of Pupils Failed	Percent of Pupils Failed	Number of Pupils Passed
A	3	.928	.019	70	8	32%	17
B	2	.861	.036	75	7	28%	18
C	5	.916	.023	75	7	28%	18
D	2	.953	.012	70	5	20%	20
E	6	.894	.027	75	9	36%	16
F	3	.914	.022	75	10	40%	15
G	1	.890	.028	75	14	56%	11
H	0	.913	.022	70	7	28%	18
I	1	.933	.017	70	8	32%	17
J	0	.917	.021	70	10	40%	15
K	4	.941	.015	65	8	32%	17
L	5	.820	.044	75	6	24%	19
M	4	.907	.024	75	4	16%	21
N	2	.948	.014	65	3	12%	22
O	1	.958	.011	70	5	20%	20
P	2	.935	.017	75	8	32%	17
Q	1	.949	.013	75	9	36%	16
R	3	.900	.026	64	1	4%	24
S	2	.941	.015	70	3	12%	22
T	1	.917	.021	75	4	16%	21
U	2	.970	.008	70	9	36%	16
V	1	.840	.040	75	5	20%	20
W	6	.818	.045	75	5	20%	20
X	0	.931	.018	74	12	48%	13
Y	4	.947	.014	70	5	20%	20
Median	2+	.917	.021	74	7	28%	18

4. The set of lowest marks given by the combined teachers in both the algebra and English groups and even the set of highest marks to a somewhat lesser degree, would each constitute a very reliable set of marks for the respective sets of papers.

ing the papers the same relative rank is illustrated very clearly by the range differences given in Table V.

Attention is called to the fact that in spite of the high correlations found in this study, Table V gives the range of marks assigned to the algebra paper No. 24 as to the reliability of teachers' marks on the basis of a single paper evaluation. For the most part the greater ranges occur in the cases of the poor papers where many teachers use a form of sliding scale for papers far below the passing standard.

TABLE V

SUMMARY OF THE VARIATIONS IN RANGES OF MARKS GIVEN BY BOTH GROUPS OF TEACHERS CLASSIFIED ACCORDING TO SUBJECT AND PAPER

Algebra				English			
Algebra Paper	Highest Mark Given	Lowest Mark Given	Range or Difference	English Paper	Highest Mark Given	Lowest Mark Given	Range or Difference
No. 1	100	85	15	No. 1	80	51	29
No. 2	81	40	41	No. 2	86	69	17
No. 3	100	90	10	No. 3	77	56	21
No. 4	75	34	41	No. 4	81	54	27
No. 5	91	60	31	No. 5	88	73	15
No. 6	100	84	16	No. 6	91	77	14
No. 7	69	51	18	No. 7	96	82	14
No. 8	99	72	27	No. 8	89	65	24
No. 9	92	66	26	No. 9	77	50	27
No. 10	96	77	19	No. 10	95	73	22
No. 11	79	55	24	No. 11	95	82	13
No. 12	88	58	30	No. 12	84	56	28
No. 13	82	44	38	No. 13	86	65	21
No. 14	100	93	7	No. 14	84	50	34
No. 15	68	42	26	No. 15	83	64	19
No. 16	79	53	26	No. 16	78	39	39
No. 17	84	56	28	No. 17	97	92	5
No. 18	85	55	30	No. 18	92	78	14
No. 19	92	56	36	No. 19	88	62	26
No. 20	86	56	30	No. 20	90	67	23
No. 21	100	91	9	No. 21	88	67	21
No. 22	81	45	36	No. 22	79	49	30
No. 23	58	22	36	No. 23	96	88	8
No. 24	89	39	50	No. 24	96	81	15
No. 25	100	85	15	No. 25	98	80	18
Correlation With Algebra Average Set	.948	.959		Correlation with English Average Set.	.951	.978	

fifty points. This difference is about as great as any found by Starch and Elliott in their studies. This also shows the fallacy of drawing valid conclusions relative

PART II

In order to understand and appreciate the relation that the results of the study in the previous section bears to the matter

of high school and college measurement, it is well to begin with a brief survey of the entire measurement situation.

Measurement in education has always been recognized as a legitimate part of the teaching process. Prior to the beginning of the eighteenth century practically all examinations were given orally. The first written examinations are said to have been introduced by Trinity College, Cambridge, in 1702 and by the close of the century they had practically replaced the formal oral examination in all schools and colleges. Thus the written examination has remained as an essential part of school procedure for more than a century.

It is only during comparatively recent times that the value of the written examination has been seriously questioned. These criticisms have been extremely valuable in that they have disturbed the sense of security which the examination enjoyed for so many years and have forced its defenders to analyze and evaluate its aims, values, materials, and methods.

The appearance of new types of examinations has introduced many new issues into the controversy. Attention has been shifted from the original question to a consideration of the relative merits of these new types as compared with the traditional thesis type. The result of these two discussions and the multitude of conflicting opinions and arguments has been to leave the average teacher badly confused. At the one extreme is the teacher who assumes that the written examination is an infallible index of the pupil's achievement and makes it the end of all teaching. At the other extreme is the teacher who takes her own efficiency as well as the progress of her pupils for granted and either refuses to give an examination or prepares and rates it carelessly, with the excuse that the scores are inaccurate and of little value. Again, we have on one hand the teacher who considers the "new type" of examination a dangerous innovation, while on the other is the teacher who considers it the final solution for all problems in educational measurement.

To enter into a detailed discussion relative to the merits of an examination in general would be to go beyond the scope of this article. Let it suffice to summarize, in this connection, the best psychological and pedagogical opinion of today which holds that written examinations, if properly prepared and administered, can be made to serve the following ends:

1. They furnish an effective means of inducing pupils to study.
2. They require a careful review of the subject and a logical organization of subject matter that has often been learned in separate units.
3. The actual writing of the examination is a valuable experience for the pupil in that it provides training in clear thinking and expression and makes the pupil conscious of shortcomings.
4. They serve as a valuable measure of achievement and progress.
5. They enable the teacher to discover the individual needs and weaknesses of the pupils.
6. They enable the teacher to evaluate methods and policies, and measure her own efficiency.
7. They enable administrative officials to measure relative efficiency of different teachers, classes, methods, and policies.

Written examinations, however, if they are to serve the above metioned ends, must have both validity and reliability. In other words, they must measure what it is desired that they measure and the results must have a high degree of accuracy.

This problem of examinations becomes extremely complicated when we view it in connection with the field of higher education. Some would have us believe that in time we shall have "standardized tests" available for use in each of the subjects of the high school and college, and that only such a type of examination can satisfy both the above criteria, viz., that the examination have both validity and reliability. This theory is questionable. The use of standardized tests in the elementary schools has increased by leaps and bounds but this is not true for the secondary schools and colleges. Yet, this difference is not due to a dearth of standardized tests, at least not in the high school. There are as many if not more standardized tests for high school subjects than for elementary school subjects. One has only to survey the list to convince himself of this fact. In English are the Hillegas, the Van Wagenen, the Lewis, the Abbot and Trabue, etc., tests and scales; in algebra are

found the Hotz, the Douglas diagnostic, the Rugg and Clark, the Rogers, Illinois, etc.; there are the Gregory, the Van Wagenen, the Barr diagnostic, the Brown and Woody, etc., in history; in Latin, the Godsey, the Holtz and Godsey, the Henmon, the Tyler-Pressey, the Starch-Waters, the Carr, the Ullman-Kirby, etc. And, so we might go on for practically every subject in the diversified curriculums in secondary education.

It might be well at this point to call attention to a number of specific limitations to which standardized tests are subjected when applied to higher education:

1. The variety and complexity of the subject matter in the high school and college makes it increasingly difficult to obtain agreement in regard to details of the educational objectives sought. While agreement on general objectives is highly desirable, there is much question as to whether or not uniformity on minute details ought to be encouraged in these fields.

2. Independent semester or term courses do not lend themselves well to diagnostic testing and remedial teaching. In the elementary school pupils pursue a few main subjects continuously over a period of several years. In such fields there is splendid opportunity for diagnostic testing before the learning period is over. Here, standard diagnostic tests would naturally flourish. In the high school and still more in the college, teachers must make this diagnosis in other ways.

3. Another limitation, and a most serious one, is placed upon the measurement of achievement in higher education by the nature of the outcomes of instruction. In the elementary school, skills and memorized facts are prominent among the desired outcomes. In higher education it is more important that the student develop continuity of thought, ability to organize and relate a series of ideas, ability to express his view and formulate judgments on his own initiative and the like.

Since it is fairly evident that the panacea of all high school and college measurement ills is not to be found in the future use of standardized tests, it becomes necessary to further investigate other types of examinations.

It is not necessary to make a complete analysis of the various forms of new type objective tests. Most any thinking person acquainted with them will recognize their merit. Without doubt, there are certain courses in both secondary and collegiate education which lend themselves well to wide use of these new tests. However, it is a serious mistake to think that the new type tests can fully usurp the place of the traditional thesis type. In order to permit of objective scoring, the former must of necessity be more or less limited to isolated and narrowly limited individual elements of subject matter. There is a great need of some measurement which provides for larger units.

Again, it is a mistake to take it for granted that the average teacher can prepare a more valid new-type test than one of the old essay type. In fact, it seems reasonable to assume that it would be easier to select ten or twelve outstanding discussion topics based on the chief objectives of a course as an essay examination, than to select several hundred or more limited elements in proper proportions so as to constitute an equally valid objective test.

Moreover, the difficulty which teachers experience in adequately determining a standard or passing mark on the old type test as shown in the foregoing experiment is in no way removed by the use of non-standardized objective tests. This situation in the case of the old type test has been the cause of most of the criticism directed against the test. What has been too long overlooked is this equally serious fault in the case of the new test.

In all probability a well balanced use of both the old essay and the new objective tests is needed in the measurement of high school and college achievement. By using more care in determining standards through a reasonable check on grade distributions, teachers in both high schools and colleges can do much to remove the most serious error in present measurement practice.

Major Difficulties in Supervised Teaching of Home Economics and Suggested Remedies

Cecile LaFollette
Supervisor of Home Economics, Training School
Indiana State Teachers College

What are some of the difficulties encountered by the teacher in charge of the courses in home economics? How may these difficulties be overcome? In order to study these problems a questionnaire based on the experiences of the writer was devised and submitted to forty teachers of home economics in the larger high schools and colleges in the eastern part of the country. Replies were received from sixty-two and five-tenths per cent of the teachers, representing fifteen states. These teachers had had teaching experience ranging from one to twenty years. The questionnaire included major difficulties in six phases of the work of the teacher: administration, classroom management, classroom methods, routine problems, organization problems, and teaching activities. Sub-points under each of these items were to be checked depending upon the frequency with which a particular difficulty had been experienced by the teacher. Difficulties most frequently encountered were checked often; those seldom encountered were checked sometimes; while those not encountered were checked never. Table I has been arranged to show the rank order of twenty most frequently encountered difficulties. That difficulty being ranked first which had the largest percentage of replies checked to indicate that the difficulty was the most frequently encountered. The other difficulties were ranked in a similar manner.

A study of the table would seem to indicate the important difficulties which should be stressed in the methods course and the supervised teaching of the prospective teacher of home economics.

It would seem that the obligation of the supervising teacher in the training school should be to supply the prospective teacher with ways and means of overcoming the difficulties of Table I. An attempt is made below to offer suggestions as to how to overcome some of the difficulties indicated above.

1. Developing hygienic, artistic, and efficient working habits in children.

A habit has been defined by Dr. Kilpatrick as "a new way of doing things that has been practiced until it carries itself—something learned so well that it has become practically automatic." Teachers should be careful to see that the "new way of doing things" is an efficient way. Numerous mental peculiarities, amounting in some instances to abnormalities, are psychologically bad habits. They are learned and may therefore be prevented. The law of exercise and the law of effect operate together in forming habits. There must be practice with satisfaction. Children who have formed bad habits may be helped by:

a. Diagnosing the particular defects or deficiencies responsible for the trouble. This is often an intricate task demanding considerable insight into the particular skill as well as understanding of human nature.

b. Making clear to the learner the sources of her trouble.

c. Encouraging the student to overcome the difficulties which she has is order to achieve normal ability.

d. Providing remedial exercises designed specifically to supplant the inappropriate reaction by effective ones.

Home economics teachers, and the general public as well, have expected too much of the girls who have had one course in home economics. The girls have been expected to become efficient homemakers in a year's time when in reality it takes a life time of practice and then some people are not successful. These girls have seemingly been expected to change miraculously with-

TABLE I.

DIFFICULTIES ENCOUNTERED BY HOME ECONOMICS TEACHERS ARRANGED IN ORDER OF THEIR FREQUENCY OF OCCURRENCE

	Difficulty	Per Cent of Replies		
		Often	Sometimes	Never
1.	Developing hygienic, artistic, efficient habits in pupils	40	56	4
2.	Helping pupils analyze and achieve high standards	36	64	0
3.	Organizing work in relation to history	32	32	36
4.	Allowing time to master difficulties	28	52	20
5.	Organizing work in relation to English	28	40	32
6.	Organizing reference material to be accessible and usable	28	52	20
7.	Providing and using adequate and suitable illustrative material	28	48	24
8.	Distributing time to all members of the class	24	48	28
9.	Keeping and holding interest of class on worth while problems where no construction is involved	24	68	8
10.	Using effective questioning	24	68	8
11.	Using tests effectively	24	64	12
12.	Organizing work in relation to art	24	40	36
13.	Organizing work to allow for gradation of difficulty of problems	24	60	16
14.	Organizing work to conform to the general aim of education	24	56	20
15.	Organizing work in relation to physical education	24	40	36
16.	Making well-motivated, stimulating, and clear assignments	20	52	28
17.	Adapting work to meet needs of individual members of the class	20	48	32
18.	Teaching girls to work independently	20	48	32
19.	Organizing illustrative material to be accessible and usable	20	64	16
20.	Organizing work that will function in the home	20	60	20

in the short period of six months to one year. They have been expected to come out of this all too short course knowing how to cook all types of food, to make any type of dress, to manage a house, to care for children, and to be always neat and clean. This is an impossibility. Skill may be acquired but it takes time. Good taste may be acquired but it is a slow process which can not be hurried or forced. No learning of art principles can ever replace living in an environment where there are certain elements of beauty. It is imperative that the home economics room be cheerful and artistic through pictures, candle sticks, and other bright and beautiful things such as flowers and a well arranged bulletin board. Art is universal. What is true in the art class is true in the home economics class. Constantly seeing and working with things that are beautiful is essential; hence, a good supply of illustrative material is needed. The teacher herself, the school environment, and the illustrative material must be examples of the principles of good design before such principles mean anything to the pupils. If the teacher is neat and clean, if she works efficiently—having all supplies assembled before beginning a demonstration —the students will acquire the same characteristics to some extent. Certain standards for appearance of products which have been set up by the class must be adhered to religiously. If teachers strive every day to place the class in the best possible environment and to arouse in the girls the desire to have the best that they can afford, it will be possible to help develop artistic, hygienic, and efficient working habits economically.

2. Helping pupils analyze and achieve high standards.

To do this it is first necessary to determine what is meant by high standards. Certainly these are varied for individual pupils. What would be excellent standards for one would be very poor for one that

could do better. Children must be made to see that they are not competing with each other but with their own record. If a girl has a "C" standard an "A" standard can not be imposed upon her. If she makes a "C+" or "B" she has made great progress and should be praised for her effort. Her trouble should be carefully diagnosed as was suggested under habit formation. Her trouble may be just a teacher-pupil clash of personalities. The teacher should be a friend to the girl and show her willingness to help and that she appreciates the student's effort to improve. Much attention must be paid to individual differences. In these ways the teacher may help the students analyze and achieve high standards.

3. Organizing work in relation to other subjects in the curriculum.

Related subject matter is interpreted to mean that subject matter or information which will complement and make more understandable the activities and problems of the home. It includes art and science as well as the social sciences, physical education, and English.

There are three ways of giving related work, namely:

As a separate course required as a prerequisite for home economics.

As a separate course (paralleling the home economics course) taught by the home economics teacher.

As an integral part of the home economics course.

a. Science.

It is always necessary to include a certain amount of related subject matter in the home economics class. For example, in a course in home decoration the chemistry of dyes and the making of sunfast fabrics for draperies, rugs, and other furnishings, as well as the art principles which apply to the arrangement of these articles may be included in the course. The chemistry of dyes may be taught either by the science teacher or the home economics teacher.

b. History.

One way of organizing work in home economics in relation to history is to cite interesting sources of material in history that are apropos of what is being studied in home economics. For example, in a costume design class the following reference would relate work to history: "Old English Laws Regulating Dress" by Sylvia Miller, in the Journal of Home Economics, February, 1928. This is using history material in the home economics class on an integrating plan.

To correlate home economics work with history the following is suggestive: When in the history class a certain people are being studied the work of the foods class can be made to emphasize foreign diets and foreign table etiquette. The clothing class can study foreign dress and if there is a class in family relationships, then family relationships at home and abroad can be discussed.

c. English.

It is not to be expected that a child will become proficient in the use of good English if the English teacher is the only one who constantly keeps stressing good English. Some girls come from homes where correct English is not spoken. When this is true the first thing to do is to create in the girl a consciousness that her choice of words detracts from the impression which she makes upon other people with whom she comes in contact. The standards for written work in home economics classes should be the same as that of the English class. Misspelled words and poor outlines turned in in the home economics class could be given to the English teacher to use as subject matter. If the girls see that not only in the English class is neatness and accuracy essential the English work will become more vital. Home economics subjects could be used as subjects for compositions.

d. Art.

Home economics girls are chiefly interested in art from the standpoint of appreciation or from the standpoint of the consumer. Successfully related art teaching should bring about certain results in the pupils. These are:

Greater appreciation for beauty whether it is found in a picture, a dress, a chair, a lamp, a winter sunset, or a bouquet of flowers.

Improved taste as indicated by their choice of clothing, by the way they set the table for a meal, or by the way they hang a picture.

Arrangement of rooms at home so that they possess some individuality and charm.

Developed conviction that expensive things are not necessarily beautiful and beautiful things are not necessarily expensive.

A desire to learn more about art and its application to every day living.

In preparing a tray for a sick person the art principles of harmony of arrangement, size, and color enter in. One can hardly think of an activity connected with the home that does not carry with it art. It is an easy matter to correlate art and home economics.

e. Physical Education.

Certainly the home economics teacher will know more about foods than the physical education teacher and could teach that phase of the work better. In turn, the home economics teacher can help in designing costumes for physical education activities.

Close cooperation between the home economics teacher and the related arts teacher is necessary to prevent gaps and overlapping. Related information is of little value if the application to every day problems is not apparent to the pupils. Children may have been taught that to remain healthy one must be clean, but if they still go without brushing their teeth and without wearing clean clothes the time spent was largely wasted. The more the subjects of the curriculum can be correlated the more interesting school work will become because it will stand out as one complete living experience.

4. Allowing time to master difficulties and distributing time to all members of the class.

These two difficulties are taken together for one can hardly think of one without the other. Only those problems that are worthwhile to every girl should be selected. Few projects should be attempted and these done thoroughly. Every one should be given time to finish her work.

One means of distributing time to all members of the class is by distributing questions. Shuffling class cards before the class assembles is one way of doing it. It is not hard to remember which pupils have been called upon unless the class is very large. In a clothing class, if the teacher tries staying "put" for the most part, she will be more likely to distribute her attention equally. In a sewing class it is a good plan to have a round table discussion before the girls go to their respective problems. The round table discussion is a clearing house for difficulties and a place to give suggestions. The whole class will benefit from it. Each girl should state where she is in her work and what she plans to do that day. If she needs help she gets it from the class or from the teacher in front of the class so that every one benefits from one explanation. In some cases, if the illustrative material is well worked out and accessible, just citing the girls to the material needed helps them to help themselves. Finally the round table discussion eliminates those who do not need special help for that day and leaves only those that do. The remaining time should be divided equally among those who are left, letting them help each other as much as possible. No loud talking should be permitted so that every one may benefit by what is being said. If it is necessary to discuss with one's partner it can be done in under tones.

One does not know whether the "Rate of Progress Theory" holds good in all cases or not—but it does hold good to some extent some of the time. With the individual projects, allowing time to master difficulties, is possible. Whether one distributes time to all members of the class shows whether one appreciates the individual differences found there.

5. Organizing reference material to be accessible and usable; providing and using adequate illustrative material.

It takes several years to build up an adequate amount of illustrative material, and the process never stops in a subject such as home economics. When first teaching seams, for example, illustrative material on seams should be made. When looking through magazines the pictures that pertain to the home should be cut out and filed in manilla folders under foods, clothing, etc. They can be mounted when they are needed. Mounting them when they are found makes the bulk of one's material too great to be cared for easily. One usually has enough material collected but it is easy

(Continued on Page Eighty-Five)

English Placement Testing in Indiana State Teachers College

Victor C. Miller
Associate Professor of English and
Director of Junior College Composition
Indiana State Teachers College

For some years, Indiana State Teachers College has sectioned the freshman composition group by means of an achievement test in English. What follows is in the nature of a history of the experiment, without reference to the statistical aspect. Let it be understood that the course referred to is the English composition course for beginners, generally called "Freshman English."

In 1918, when the immediate responsibility for the beginning composition course began to fall into the hands of the present writer, it was apparent that some changes should be made.

The course had originally been a sophomore course, and had been planned to succeed a freshman year of grammar, but little attempt had been made to restrict registration in it to sophomores. The consequence was that sections frequently included students of all grades of advancement, freshmen, sophomores, juniors, and seniors. The situation was manifestly unfair to both students and instructors. The freshman who found himself in a group of upperclassmen soon realized that he was subject to unfair competition; his motor had to run like blazes to keep him within sight of the other machines. Moreover the upper classman who fell into a section of freshmen discovered himself blessed with a "snap" course. Instructors will not need to be reminded how nearly impossible and how thoroughly unsatisfactory is the attempt to adjust teaching to such a heterogeneous group.

The first step taken consisted merely in scheduling four sections at one hour, say at eight o'clock. In those days, students practically mapped out their own work. In order that the appearance of innovation might be held to a minimum, students were permitted to continue to think, on registration day, that they selected their own sections and instructors in composition. They likely found themselves (sometimes sadly) deceived. At the first meeting of the class a test in fundamentals was given. At that time we knew of no published tests; we, therefore, devised our own. The tests were marked, the hundred students (four sections, a section being limited to about twenty-five members) were ranked according to their marks, and, at the second meeting of the class, such shifts from one section to another were made as would bring into one group the upper twenty-five, into another the second twenty-five, into still another the third twenty-five, and into a fourth group the lowest twenty-five. This is as much as was then feasible by concerted action. The work of each section was, from this second class meeting onward, determined by the instructor in charge, without interference and without conferences.

The gains resultant from the testing-and-shifting process consisted in greatly narrowed extremes of preparation within each group, and an approach to the possibility of pitching the work on a common level. There existed less likelihood of any student's finding the course very light or very heavy. The losses included, first, I am disposed to say, one day's time. True one hour was consumed in giving the tests and most of another in making the shifts, but consider how many first hours could not be reduced advantageously to ten or fifteen minutes. Another loss was found in the mental resistance of the students who found themselves shifted from the instructor whom they preferred to one whom they wanted to avoid.

To accomplish only so much and to smooth out the machine made necessary five hundred miles of slow driving. The problem of restricting registration to freshmen by forcing all freshmen to take the

course proved to be no easy one. Prejudice favorable to the older freely elective system and the difficulties of administration stood in the way. For several years the catalogue description of the course had included the statement that it "must be completed during the freshman year," but all attempts to enforce the provision proved ineffective, and no practical progress was made until 1928. At this time certain conditions made it seem advisable for all departments in the college to "place" courses as freshman, sophomore, etc., and the freshman composition course was carried along on the tide; as a result that problem is now solved.

In the meantime the plan of classifying the students had been carried on on a small scale, and experience had led to a measure of confidence in the practice. Some generlizations began to take shape. It seemed apparent that there was a group of entrants whose preparation, even with the help of a quarter of training in fundamentals, did not enable them to prepare an acceptable manuscript. Possibly they can not learn to write even in an elementary way. It looked as if students whose chief interest was found in some variety of special work stood lower in their mastery of English fundamentals than others.

Before the opening of the spring quarter of 1925 we had discovered the "Cross English Test,"[1] and from that time on until the winter quarter of 1928 it was exclusively the means of classification. Its use added confidence and satisfaction—confidence because it was comprehensive as compared with our own more or less make-shift tests, and because it was evidence that others had faith in testing for placement; and satisfaction because it made for simplicity and ease of manipulation.

For the winter and spring quarters of 1928 and for the school year of 1928-1929 the "Iowa Placement Examinations"[2] were used and for the present year, 1929-1930, "Tests of Ability to Use Correct English"[3] have been used. As to results there is among the three little choice; in ranking the testees one functions as well as another. The one requisite is consistency of scoring.

When the college began, last year, September, 1928, to provide for the registration of freshmen during the week preceding the actual opening of school, the opportunity was afforded to handle the testing in an efficient and economical way. Since then it has been possible to send freshmen, other than hang-overs, to their proper sections for the first meeting of the class. Moreover the fairly effective attempt to enforce the provision that freshman composition be done during the freshman year has given the department immediate contact with practically every entering student. This plus moral support is all that can be asked from the administration.

The manipulation of the data obtained is a responsibility assumed by the Division of Research, and as a consequence we know, soon after the tests have been scored, the rating of students. We know, for instance, that the median score for approximately six hundred students who took the "Iowa Placement Examination" is somewhat lower than the median score as determined by the authors of the test. As a second consequence we are able to give a student his rating as compared with his fellow students. Emphasis should be placed on the last phrase of the foregoing sentence; the important detail is that any student is judged by comparison with his fellows. This seems more satisfactory than if the basis of comparison were some group with which he had no contact. We all have a tendency to over-value the strange and to under-estimate our own work. But all are fairly willing to be measured by comparison with those with whom they must compete. At the same time, the department finds it an excellent corrective to know that students who come to this institution are somewhat under the standard.

To meet the needs of entrants with low-grade preparation, a course known as "English 0" was listed in the catalogue of 1928-1929 and described as designed for

[1] By E. A. Cross. World Book Company, Yonkers-on-Hudson, N. Y.
[2] By M. F. Carpenter and G. D. Stoddard under the direction of C. E. Seashore and G. M. Ruch. Extension Division, State University of Iowa, Iowa City, Ia.
[3] Bureau of Personnel Administration, Mills Building, Washington, D. C.

insufficiently prepared students. The aim of the course was drill, drill, drill on mechanics. Bear in mind that we lacked experience. Of a total of thirteen sections, we set three sections, seventy-five students, at work on elementary matters with definite instructions that the course carried no credit, and that the right to discontinue it might be earned at any time by attaining a median score or better. Most students know themselves very well, and the resistance was surprising small. At the end of each four weeks an opportunity was offered to repeat the test. By the end of the quarter, two of the seventy-five had actually earned credit for the first quarter of composition, and a third of the whole number had earned the right to begin a course for credit. But at the end of the year, there remained a group that had made little or no progress. Consolation for the instructors was obtained from a study of the psychology ratings of these individuals, and from a study of the grades they had earned in their other work. To find that students who had made little progress in their English work had earned low grades and many failures in other departments, and that the correlation between English test results and psychology test results was relatively high[4] gave the English faculty a feeling of safety.

That one of the serious obstacles in the way of progress for these English 0 students was a pronounced indifference soon became evident. A search for the means of motivating the work was begun. Every plan that ingenuity suggested was given its chance. Certainly relegation to the English 0 course was a penalty on poor work. Premiums were also placed on good work, but both approaches met with but indifferent success. Finally, in the effort to find a means of attaching an appreciable value to advancement, it was recalled that "Touch a man on his purse, and you touch him where he lives." It was suggested that the charging of a fee against the English 0 course might serve as incentive. After as many-angled consideration as possible, a proposal to make such charge was presented to the President, was approved by the Board of Trustees, and was put into effect with the beginning of the present quarter. After so brief experience, the question still to be answered, is the collection of the fee justifiable? The answer lies yet in the future.

Imposition of the fee entailed a consequent problem, that of justice to the student. In order, therefore, that any errors made should favor him, the passing score on the test was deliberately lowered so much as to reduce the number of penalized students by a third. The student received the benefit of the doubt. Care has been exercised not to subject the department to the charge of profiteering. Of course, the real defence for the action lies in the fact that the work of the course is of high-school caliber, a level of work which the college desires not to offer, because it is preparatory to college, and for which the individual who has not made the most of his high-school opportunity should be willing to pay.

One other means of avoiding injustice to the student may be mentioned. He is permitted to repeat the test at given intervals, and, if he passes out of the section, all or part of the fee is refunded, depending on the length of time he remained in it. Thus we believe we succeed in being fair.

All students who escape the English 0 the quality of work they do. High secenter credit sections, and pass or fail on tions require little teaching and so far have contributed no failures. Intermediate sections have turned out to be really intermediate. Confidence grows in the plan of classification by means of the placement test. This is the place at which we now stand.

[4]For this fact I am indebted to the Division of Research.

On request, school officials may secure available data concerning individual students. Address V. C. Miller, director of junior-college composition, Indiana State Teachers College, Terre Haute, Ind.

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Attention has been directed to the efforts of the teachers colleges to keep abreast of the present tendencies in higher education in several of the yearbooks published this last year. After presenting the results of a study on efforts to improve instruction in teachers colleges, one of the reports makes the following significant statement: "Unfortunately, less than one-fourth of the total number of teacher-training institutions to which inquiries were sent replied. Of those which did reply, nearly forty per cent reported that they were doing nothing significant. It is obvious, therefore, that at least one-half of the teacher-training institutions of the country are not as yet actively contributing to the improvement of instruction."[1]

Another yearbook has been given over to the problems of articulation of the various units of American Education.[2] That part of the yearbook devoted to teacher-training is closed with a list of problems suggested for research and publication in subsequent reports. The list of problems is given below, but the reader is referred to the yearbook for the full discussion of each problem.

A. Problems of Articulation of Teacher-Training Institutions with Public School Units:

1. The selection of students.
2. Placement and follow-up.
3. Relation between pre-service and in-service training for teaching, administration, and supervision.
4. Certification for professional school service.
5. Curriculum studies in teacher-training.
6. Training school facilities.
7. Articulation of high schools and teacher-training institutions.
8. Research service in state school systems.
9. Determination of faculty qualifications.
10. The arts college and teacher-training.
11. Legislation affecting administrative control of teacher-training.
12. Locating teacher-training agencies within the state.
13. Relation of probable tenure to the pre-service education of teachers.
14. State versus city teacher-training agencies.

B. Problems of Articulation Within and Among Teacher-Training Units.

1. Allocation of functions among the teacher-training agencies.
2. Optimum size of the teacher-training institution.
3. Methods of financing teacher-training.
4. Methods of disbursement and accounting.
5. Determination of usable unit cost in teacher-training.
6. Social education.
7. Health service and health education.
8. Library service.
9. Physical plant and material equipment.
10. Faculty organization.
11. Transfer of credits.
12. Publications.

The Teachers College Journal is anxious to be of service to the teachers colleges of the country. It is believed that one way of being of service would be to report studies that have been made in the teachers colleges dealing with any of the problems referred to above. We shall welcome articles that will help to contribute to the solution of the problems listed and which in turn will indicate that the faculties of the teachers colleges are earnestly at work on the various phases of their own problems. We believe the future will reveal that this is the case in practically all the teachers colleges.

[1] "Current Educational Readjustments in Higher Education." Yearbook Number XVII of the National Society of College Teachers of Education. University of Chicago Press.

[2] Seventh Yearbook, The Department of Superintendence.

Freshmen College Enrollments in Indiana on Teacher Training Courses

Robert K. Devricks
Registrar and Director of Studies
Indiana State Teachers College

There has been a noticeable variation in the number of beginning students enrolling on the various teacher-training curricula in Indiana during the past three years. Figures are available for this three year period making it possible to study the trends in enrollments and speculate on their significance. Beginning students are those who are entering college for the first time and indicate their intention to prepare for teaching.

The data for this study were obtained through questionnaires sent to the colleges of Indiana that are approved for training teachers. Based on the number of teachers trained in the various colleges the data are ninety per cent complete. The influence of the ten per cent not reporting on the results if reported would be negligible.

Beginning students are used in studying the trends in enrollments because they supply the qualified teachers two years hence for the elementary schools and four years hence for the high schools. No very conclusive studies have been made in recent years concerning the teacher supply. We may assume, however, that the supply has been adequate with perhaps a surplus in some lines of work. We should be informed of the exact status of teacher supply so that the number of teachers trained could be controlled so as to meet the specific demands. Without this detailed information we can only "view with alarm" any radical fluctuations in the number of teachers who enter teacher-training courses.

At the present time there is not enough available information on the supply and demand for teachers to warrant the student advisers in the colleges in attempting to direct their students into the most profitable fields of teaching. It takes from two to four years to train teachers. If left to chance we have no assurance that the balance between supply and demand will be maintained through this long period of preparation. There has been considerable dogmatic thinking and irresponsible talking concerning the teacher supply during the last three or four years. As will be shown later the numbers entering the elementary, regular college, and special college courses have been varying sharply. This propaganda may have influenced the beginners. Perhaps student advisers have been directing students into the curricula that they think offer the best opportunities for positions.

It is quite evident that whatever the influences have been that they have been exercised without adequate knowledge of the situation. Advice to students should not be based on rumor or personal opinion or prejudices. Some attempt should be made to bring out the facts. The teacher-training institutions should feel some responsibility for giving dependable advice to their students. An organized effort should be made to gather data each year on the demand and supply of teachers and an attempt should be made to guide students into the lines of work where they are needed.

The data presented herewith call attention to the trends during the past three years. No one knows definitely whether they are in the right or wrong direction. We may be approaching a crisis or we may not. If this study does no more than direct attention to the necessity for a thorough study of the problem it will have accomplished its purpose. Table I shows the percentage relationships of enrollments in the elementary courses for the fall terms of 1926, 1927, 1928, and 1929. Table II shows the relationships for the regular college enrollments and Table III the enrollments in the special subject courses.

TABLE I.

ENROLLMENT OF BEGINNING STUDENTS ON ELEMENTARY COURSES, SHOWING THE NUMBER ENROLLED IN 1926 AS THE BASE OR ONE HUNDRED PER CENT AND THE PERCENTAGE RELATIONSHIPS OF THE FOLLOWING YEARS TO THE NUMBERS IN 1926.

Licenses		Elementary Enrollment of Beginners			
		1926	1927	1928	1929
Primary	Number	410	335	268	223
	Per Cent	100	81.7	65.3	54.4
Intermediate-Grammar, and Rural	Number	745	629	398	300
	Per Cent	100	84.4	53.4	40.2
Total Elementary	Number	1155	964	666	523
	Per Cent	100	83.4	57.6	45.3

Table I is read as follows:—There were 410 beginners who registered on the primary course in 1926. In 1927 there were 335. Using 410 as the base, the index percentage in 1927 was 81.7 per cent. In other words, there was a loss of 18.3 per cent in enrollments in 1927. The index percentage in 1928 was 65.3 per cent and in 1929 it was 54.4 per cent.

TABLE II.

ENROLLMENT OF BEGINNING STUDENTS ON THE REGULAR COLLEGE COURSE SHOWING THE NUMBER ENROLLED IN 1926 AS THE BASE OR ONE HUNDRED PER CENT AND THE PERCENTAGE RELATIONSHIP OF THE FOLLOWING YEARS TO THE NUMBERS IN 1926.

License		Regular College Enrollment of Beginners			
		1926	1927	1928	1929
Regular High School	Number	595	598	854	889
	Per Cent	100	100.5	143.5	149.4

TABLE III.

ENROLLMENT OF BEGINNING STUDENTS ON THE SPECIAL SUBJECT COURSES SHOWING THE NUMBER ENROLLED IN 1926 AS THE BASE OR ONE HUNDRED PER CENT AND THE PERCENTAGE RELATIONSHIPS OF THE FOLLOWING YEARS TO THE NUMBERS IN 1926.

Special High School License		Special College Enrollment of Beginners			
		1926	1927	1928	1929
Art	Number	44	33	28	24
	Per Cent	100	75	63.6	54.5
Commerce	Number	65	62	91	79
	Per Cent	100	95.4	140	121.5
Home Economics	Number	30	59	35	32
	Per Cent	100	196.6	116.6	106.6
Industrial Arts	Number	24	44	38	32
	Per Cent	100	183.3	158.3	133.3
Music	Number	87	56	115	127
	Per Cent	100	64.3	132.2	146.
Physical Ed—Men	Number	34	58	54	64
	Per Cent	100	170.6	158.8	188.2
Physical Ed—Women	Number	50	38	29	46
	Per Cent	100	76	58	92
Total Special	Number	334	350	390	404
	Per Cent	100	104.8	116.7	120.9

The loss on the primary course for the three year period was 45.6 per cent and on the intermediate-grammar and rural courses it was 59.8 per cent making a loss of 54.7 per cent of all elementary courses. This is a decline in enrollments of approximately 20 per cent each year. If the loss continues we shall soon be without a sufficient supply of qualified elementary teachers. We are at a loss to explain this downward trend. It may be due to the reports that are current to the effect that there is a large surplus of elementary teachers. The reports have been so exaggerated that the effects may be disastrous. Some effort should be made to check this trend before a crisis is reached.

The explanation for the loss of elementary teachers-in-training can not be accounted for wholly by attributing it to propaganda. Although the reports of surplus high school teachers have not been so exaggerated they should have had some effect on the enrollment in high school courses. On the contrary they seem to have had no effect for the gain on high school courses is approximately equal to the loss on the elementary. Table II shows a gain of 49.4 per cent for the high school, while Table I indicates a loss of 54.7 per cent for the total elementary group.

There has been an increase in the special subject courses but the increase was not so great as for teachers of the regular high school subjects. The average gain for the entire group of special subjects was 20.9 per cent. There again is an anomalous situation. The demand for teachers has been much greater in these special subjects than for regular high school subjects, yet the percentages of increase have been smaller.

Public opinion on the teacher supply undoubtedly has had considerable influence on the students' choice of courses yet the results have been so out of harmony with what we have been led to expect that we must recognize that there have been contributing factors. It has been suggested that fewer are training for elementary teaching because of the increase in standards, the second grade elementary license having been eliminated this past year. This conclusion is not sound because the numbers on four-year courses have been increasing and second grade licenses have been eliminated in this case also. The attitude of the public towards higher education has very probably caused the shift from the two-year to the four-year courses. The boys and girls of today seem to be more ambitious than formerly. Nothing short of a degree will satisfy this ambition.

This superficial investigation shows the trends in enrollments but does not offer satisfactory reasons for the fluctuations. It is not essential that we know the underlying causes except that if we know what they were we would be better able to control and direct these influences. If our objective is to direct the teacher supply into the departments where the demands dictate, we may do so by obtaining accurate data on the demands for teachers in the various lines of work and control the supply by following up with investigations similar to this presentation.

MAJOR DIFFICULTIES IN SUPERVISED TEACHING OF HOME ECONOMICS

(Continued from Page Seventy-Eight)

to forget where it has been placed. Some filing system should be worked out to suit the different teachers' needs and the material so organized that when an article is wanted it can be found. Pictures which have been mounted should be filed by the same sytem.

6. Organizing work to conform to the general aim of education.

Home economics more nearly conforms to the aims of education than any other subject. Dr. Bonser of Teachers College, Columbia University, has said that the term "regular subject" probably will be applied to home economics and the subjects that function in the lives of the students daily sometime and the term "special" to algebra and some other subjects which make no appreciable difference in the behavior of the students. Certainly home economics contributes to all of the seven cardinal principles of education with special emphasis on worthy home membership and health.

As a final point—the home economics teachers should bring in the "plus" of home economics rather than to be content with the skills.

Policies in Colleges of Education

J. B. Shouse
Dean of the Teachers College
Marshall College, Huntington, W. Va.

The study which follows is confessedly partial in that it depends almost entirely upon catalogue presentations. Actual practices, interpretations of catalogue statements, projected reorganizations, background of existing situations, these and other items of information should be possessed as a foundation for anything like a judgment of consequence. Nevertheless, if catalogue statements of a group of standard institutions will not yield a fairly clear picture of present relations between the arts college and the college of education, in institutions maintaining both organizations, then the situation must be considered somewhat obscure.

One may well start his descriptions with a fairly simple situation such as that disclosed in the University of Texas catalogue (of May, 1929). The school of education lists six departments of instruction, recognizing them as departments; art of teaching, educational administration, educational psychology, history and philosophy of education, physical education, rural education. Its descriptions of courses do not include any courses not properly recognized as belonging to these departments; the physical education department presents courses primarily for teachers. The course descriptions of the college of arts and sciences, in turn, do not overlap those of the school of education save for announcement of special methods courses, listed as education courses taught by arts faculty members.

The school of education offers the degree bachelor of science in education, and asserts that "students who have completed thirty semester hours, and who expect to become candidates for the degree ..... should register in the school of education." "But this does not mean that students may not register in the school of education later in their college course." However, registration in this school is not required even if one should wish to pursue courses in education. The college of arts and sciences announces that while education courses do not count as major or minor, as many as twenty-four hours of education may be counted toward its B. A. degree. This practice is given recognition by the school of education in its regulation that "other students of the university may enroll in education courses by following the same routine as is required for enrollment in other university courses, after meeting the prerequisites for the particular course involved."

The summary of attendance shows 1,718 students from other divisions of the university taking work in the school of education, while only 117 students registered primarily in that school, during 1928-1929. Although the school of education was established in 1906, no separate degrees were given until 1925, being first authorized in 1923. The school of education conferred fifty-nine degrees in the first four years under the new arrangement. That nineteen of the fifty-nine were conferred in 1928 may signify an increasing trend toward registration in, and graduation from, the school of education.

Quite evidently this is a prime example of a clear-cut policy of administration. The elements of the policy are these: (1) the school of education exists for the purpose of presenting a group of professional courses for the training of teachers; (2) the school of education is not concerned to press the matter of registration of students under its own administration; (3) it recognizes the fact that most teachers prepare incidentally for teaching service. That is, the emphasis is upon the administration of certain courses of instruction rather than upon the administration of curricula. There is no attempt to build up a large student roster; in other words, there is no attempt to regard the direction of the preparation of the prospective teacher, academic as well as professional, as the first function of the school of education. In view of the manifest institutional policy

discovered by examination of the catalogue, one is prepared to grasp the significance of the statement early in the catalogue to the effect that "there has been appointed a permanent committee on teachers representing the university as a whole, and the official nominations to school positions are made by this committee." This statement is consistent with the general policy, that the school of education does not have primary direction of the students who are to be teachers.

To show that this is not an isolated instance, one might cite other institutions. The University of Iowa affords a fairly close parallel. According to the 1927 catalogue, the staff of the college of education is made up of the department of education staff, arts teachers who give special methods courses, and instructors in the observational schools. In the general information section of the catalogue no statement of admission requirements for the college of education is found; in the announcements of this college a note is supplied to the effect that admission requirements, as respects high school credits, are the same for the college of education as for the college of liberal arts. Education staff is listed in the liberal arts faculty. Heads of departments of the university constitute the committee on placement of teachers, dean of the college of education being chairman. Arts students may major or minor in education. The summary of attendance for the year contains no report for the college of education or for the school of journalism, although it does for all other colleges and schools; presumably the college of education enrollment is merged with that of the college of liberal arts.

It has been shown concerning the University of Texas and the University of Iowa that the policy is to restrict rather rigidly the departments and the instructors to be included within the professional school, confining the faculty list of the education college to those instructors who give courses in education. A radically different policy is observable in the catalogue of Ohio University. (April, 1929).

The organization of this institution is distinctive in that the college of education includes fifteen departments, several of which are ordinarily regarded as academic, and therefore as part of the arts college. The departments making up the college of education at Ohio University are the following: agriculture, art, civic biology and botany, education, English language and literature, geography and geology, health, history and government, home economics, industrial education, mathematics, physical education, psychology, school music, sociology.

The college of liberal arts in this institution maintains departments of biology, English language and literature, European history, as well as many other departments not found in the college of education. Each history department lists several instructors, there being no duplication; English faculty lists show seven names in each college, one being duplicated; biology shows five teachers in liberal arts and two in college of education without duplication.

Further to illustrate the situation, attention may be called to the English offerings in the college of education. Thirty-two courses are announced in the catalogue, including composition and literature courses, as well as methods courses. The department of history and government of the college of education gives American history courses only; the European history department of the college of liberal arts makes a special note in its catalogue section to the following effect: "Students in the college of liberal arts may elect courses in American history in the college of education." The mathematics department of the college of education offers courses in freshmen algebra, plane trigonometry, and statistics, in addition to methods courses in mathematics. The biology department of the college of liberal arts confines its courses in the main to animal biology, although not strictly so; its course in personal and public health might be regarded as duplicated by the college of education course in principles of health.

First impression, as one examines this situation, may be that an arbitrary division of labor, on the live and let live policy, has been established between the two colleges of Ohio University. Nevertheless, the institutional policy evidently includes the principle that a college for the training of teachers must be vitally concerned in the academic as well as the professional

training of the teacher. State it differently: certain aspects of academic training are so decidedly professional that the professional school should give that academic training, organized and presented as effectively as possible from the point of view of the teacher. This idea of professionalized subject matter is a familiar one among teachers' colleges not integral parts of university organizations. It is unusual among colleges of education in universities.

The Ohio University type of organization is found in Marshall College. This institution was operated for years by the state of West Virginia as a state normal school, and was converted into a degree-granting teachers college in 1920. Because of the large number of students desiring a purely academic curriculum, the state board of education in 1924 ordered the organization of the college of arts and sciences co-ordinate with the teachers college. The latter already had its organization of academic work, in part adapted to the needs of prospective teachers in particular. Consequently it is not surprising to find in the catalogue (of June, 1929) some apparent duplication of departments. In the teachers college there is a department of biology, while the college of arts and sciences maintains departments of botany and of zoology; each college has an English department, as well as a history department. Faculties are essentially distinct from each other. In this institution, as in Ohio University, in contradistinction from practice in many other places, provision is made for the enrollment of prospective teachers in the professional school throughout the full period of their college work, although such enrollment may not be compulsory throughout the entire period. This is in clear recognition of the idea that a unit should be made of the preparation for teaching, as nearly as may be possible, with the guidance in the hands of the professional school. Some pressure is brought to bear upon prospective teachers to enroll in teachers college by the regulation that arts students may not elect more than eight semester hours in education.

To judge from the catalogue statements of Ohio University and Marshall College, they have organized themselves with the following policies in mind: (1) prospective teachers should be under the control of the professional school throughout the period of preparation in college, with respect to both academic and professional courses; (2) to the extent that may seem advisable the academic courses should be taught by a faculty definitely belonging to the professional school, with the teaching point of view to the front in these courses; that extent has not been definitely determined, but might logically end with the establishment in the professional school of all academic departments represented in public school programs; (3) preparation for teaching not being merely incidental, the administration of curricula is the function of the professional school, and not merely the administration of a group of professional courses.

In line with some aspects of this policy is a practice of Indiana University. In the college of arts and sciences, students may minor or may major in education; in case of major selection, such selection must be approved by the dean of the school of education, as must also the selection in both academic and professional fields. (Catalogue dated August, 1928). This institution combines features of the two distinct policies outlined above: it does not recognize the exclusive right of the professional school to the direction of the prospective teacher, but does admit that school to a share in such direction.

Ohio State University also has an arrangement for combined control. It offers an arts-education combination curriculum for a total of five years of work. That this combination is not to be thought of as one year's work in one college superimposed on four years of work in the other college is made clear by the following statement: "In general the candidate will find it necessary to carry on courses in both colleges, throughout the last three years of the combination curriculum, completing the work of both colleges simultaneously. The two degrees will therefore be conferred at the same time." (Catalogue of June, 1927). However, it is not necessary that Ohio State University students should register in the college of education or in the combination curriculum in order to take courses in education.

At Syracuse University the teachers college and the college of liberal arts announce a combination curriculum in physical education. The work requires five years, and two degrees may be obtained—A. B. and B. S. in physical education. (Catalogue of 1928). However, the students in this combination curriculum are under the jurisdiction of the college of liberal arts for four years, and must take all of their work in that college during the first two years; only during the fifth year are the students under the control of teachers college. That there is at least a courtest arrangement between the two colleges is indicated by the following statements of the college of liberal arts: "A student in the college of liberal arts may, after he becomes a junior, take for credit a limited number of hours in another college or school of the university, but only with the permission of his major professor, the approval of his class committee, and the consent of the dean of the other college or school."

Combination curricula are mentioned in some other catalogues but the significance is not always very explicit. New York University announces a combination college-education curriculum maintained cooperatively by the Washington Square College and the school of education, but the place of registration and the location of direction of the student are not made clear. This might operate as a really unified joint control, or it might be nothing more than an arrangement permitting students registered in one college to work more or less freely in the other, with distinct separation in the direction of the two phases of the preparation of the teacher. (Catalogue dated June, 1927).

The University of Cincinnati does not close the education courses to students in other colleges, but does provide that "all students taking courses in the college of education must be registered and duly classified in the college of education, even though parallel registration is maintained in another college of the university." (Catalogue, July, 1929).

At the University of Minnesota restriction of the privilege of electing education courses is extended to rather unusual degree. Although an examination of the announcements of the college of education does not reveal such limitation, the dean of that college is authority for the statement that "Arts college students do not take courses in education, nor do students in engineering, law, or medicine." This college of education has several four-year specialized curricula open to freshmen and sophomores, although in general its students enroll at the beginning of their senior college work. It has established the following regulation: "Students registered as freshmen and sophomores in the college of education will be guided by the faculty regulations of the college of science, literature, and the arts, but will be amenable to the student personnel committee of this college." (Bulletin of the college of education, May, 1928).

The teachers colleges which operate in complete segregation from arts colleges are in somewhat strategic position. They may at once assume complete control of student work on the assumption that preparation for teaching is the primary objective; they may make the same assumption in the organization of curricula; they may make the same assumption in selecting faculty members. They are, therefore, able to set the pace for colleges of education in university organizations in these respects. The latter have the option between two alternatives. They may follow the lead of the teachers colleges by establishing complete curricula, with their own academic departments, and with four-year direction of the students. Or they may continue as they appear to have started, as organizations professional in character only in respect to the study of the technical information germane to the business of school teaching and administration. Even a limited analysis of what colleges of education are doing suggests a trend from the latter toward the former policy.

Around the Reading Table

The Michigan Instructional Tests in Physics. By Paul V. Sangren, director of educational research, and Walter G. Marburger, instructor of physics, both from the Western State Teachers College, Kalamazoo, Mich. Published by the Public School Publishing Company, Bloomington, Ill.

A distinctly new type of instructional test for high school physics has been released recently under the co-authorship of Paul V. Sangren and Walter G. Marburger of the faculty of the Western State Teachers College of Kalamazoo, Mich. Professor Sangren is the director of educational research of the college and Mr. Marburger is an instructor in physics in the same institution. These tests, therefore, apparently come to us with the two points of view represented, namely that of the educational expert and that of the physics teacher. This is indeed no small advantage, for these two points of view must be reconciled if any sort of success is to be expected.

The Sangren-Marburger tests are quite the most comprehensive of any high school physics tests ever attempted. They consist of twenty-two tests covering the whole field of physics and in addition a final examination test is added as well as a diagnostic test to be given at the beginning of the term. Each test consists of some thirty or forty points so that no one can complain of a lack of comprehensiveness. These tests have been standardized from the results obtained from some eight hundred students of high school physics. The norms are worked out for each test and a profile chart is supplied with each set. Thus the pupil is supposed to be able to tell from a study of his own profile chart, just where in the field of physics he is weakest and strongest. The tests are to be given of course as the physics course progresses, and since there are twenty-two of these progressive tests, the student and teacher should know how well this particular bit of subject matter is being achieved. Moreover the really ambitious teacher may take steps to improve instruction and the ambitious student may improve his methods of study.

The norms submitted indicate that the majority of these tests are of about the right degree of difficulty for a good distribution of scores. However, it appears that in tests VI, XI, XII, XIV, XVIII, XX, and XXII, there are not enough scores in the two upper quartiles to permit a fair distribution. In general it appears that the first seven tests on mechanics have been much better worked out than those covering the other fields of physics.

As has been said before these tests are by far the most comprehensive of any of this kind ever published. However, the teacher should not be misled into thinking that these tests or any other set of tests will solve the problem of instruction in physics. Physics like all other experimental sciences must fall back upon the laboratory in the final analysis. These tests do little in the way of encouraging a pupil to put forth his original ideas. It may be old fashioned to say this, but the author cannot get away from the idea that an old style essay type of examination in physics is invaluable now and then. When a student is required to derive a physical law from first principles and when he has set forth his ideas in good understandable English, he has achieved something and the intelligent teacher who reads his paper knows he has achieved something.

The cost of these tests will amount to about fifty cents per pupil for the complete set and this is not to be overlooked. Of course the teacher will have a great array of scores on the final day of school upon which to base the final grade and this is a good thing to have because figures are impressive to say the least. The teacher of physics who is intelligent enough and ambitious enough to supplement these tests with real genuine instruction and laboratory practice as well as with other tests of a more constructive character should do a good job teaching high school physics. The danger however lies in the fact that the average physics teacher, especially if he imagines he is very busy, may put all his eggs in this one basket of instructional tests. The product turned out may be full of physics information,

fairly well versed in differentiating Archimedes' principle from Ohm's Law, in fact nice little smooth running physical robots but not thinkers. Professors Sangren and Marburger have contributed in these tests a valuable aid in the teaching of high school physics, and, aside from the rather excessive cost per pupil they should be a very material aid to the teacher in determining achievement. When used as their authors have intended and with the restrictions already pointed out, their value is unquestionable.—

James F. Mackell,
Professor of Physics,
Indiana State Teachers College.

Business Administration of Public Schools. By Harry P. Smith, World Book Company, 1929, p. XV + 432.

With its simplicity of arrangement and its clarity of style this book is a much needed presentation of those activities and practices which are usually associated with the business aspects of public school administration. While it will be welcomed by college teachers of public school business administration because of its value as a textbook, it will also find its place at the right hand of the administrator on the job—a ready tool for daily use. A few chapters are devoted to underlying principles of school business administration. While these chapters make a distinct contribution to the subject as a whole, it is in the chapters given over to specific problems that the author is at his best. Here are presented the functions of the specific problem together with the technique of handling the problem in its setting on the job. School budgetary procedure, accounting and its problems, financial reports and publicity, insurance, purchasing and supply management, and problems of capital outlay are among the specific problems treated.

Hoosier Attendance Officer. Published by the Division of Attendance, State Department of Public Instruction, Indianapolis, Ind.

Publications of the Hamtramck, Mich., Schools:

"The Magic Vase". A pageant of the history of pottery which was created by the art department, assisted by the literature, auditorium, and music and health departments of the Kosciusko school. Written by teachers and pupils in the school.

"Fabrics and Fashions". An original pageant first produced by the Whitney school. Written by Edys Somers and Kathleen Hansen, teachers of literature in the school.

Building Rehabilitation in Hamtramck. Hamtramck, Mich., Public School Bulletin.

This is a graphic story of the remodeling of one of the schools in Hamtramck this last summer. It shows what a great saving such a project was to the taxpayers of Hamtramck and yet it provided the children with a modern school.

Our City Schools. Published by the Board of Education, Indianapolis, Ind.

A monthly publication issued by the Indianapolis Board of School Commissioners.

The Principal As A Supervisor. Research Bulletin of the National Education Association, November, 1929. Vol. VII, No. 5.

This bulletin contains a discussion of the following topics: The Principal in a Program of Supervision; General Problems in Supervision; The Background for Supervision; Classroom Visits; Individual Conferences; Teachers' Meetings; Demonstration Teaching, and Pupil Guidance and Adjustment.

Bulletin of the Department of Elementary School Principals. October, 1929. Vol IX, No. 1. Published by the Department of Elementary School Principals of the N. E. A.

Full of topics of interest to the principals of the elementary schools such as: Mental Health and the Principal; The Elementary School Principal as a Supervisor; Planning the School Work; Fitting Instruction to the Child; Geography for a New World; Community Relationships; Student Participation in School Government; Study of Credits in the Lakewood Public Schools; The Principal and Extracurriculum Activities; Character Training in the Home; Evaluating Educa-

tion in Terms of Rural Needs; The Library as an Integral Part of Elementary School; Measuring Reading and Arithmetic in Terms of Mental Ability, as well as departmental news.

Educational Tests for Use in High Schools, Third Revision. By Charles W. Odell, assistant director, Bureau of Educational Research. University of Illinois Bulletin, Vol. XXVII, No. 3. University of Illinois, Urbana, Illinois.

Sixteenth Annual Conference on Educational Measurements. Bulletin of the School of Education, Indiana University. Vol. V, No. 6. Indiana University, Bloomington, Ind.

A complete report of the proceedings of the conference which was held at Bloomington on April 19 and 20, 1929.

School of Education Record. Published by the University of North Dakota, Grand Forks, N. Dak.

Report of the Committee on Retirement Allowances of the National Education Association. Published by the N. E. A.

A printed copy of the report presented at the Atlanta meeting of the National Education Assocation.

School of Education Bulletin. Published by the School of Education, University of Michigan, Ann Arbor.

Full of news of the college, especially of the school of education.

Field Problems of Wisconsin Rural Teachers. Published by the State Department of Public Instruction, Madison, Wis.

The purpose of the study was to provide a partial content for teacher-training curricula and to be used as an agency in the supervision of teachers in service. The problems listed are equally useful to the supervisors of teachers in service.

Vocational Education News Notes. Published by the Division of Vocational Education, University of California, Berkeley.

Full of news of interest to various vocational departments.

Department of Interior Bulletins:

"Some Phases of Nursery-Kindergarten-Primary Education, 1926-1928". By Mary Dabney Davis, specialist in nursery-kindergarten-primary education, Bureau of Education. Bulletin, 1929, No. 29.

"Review of Education Legislation, 1926-1928". By Ward W. Keesecker, assistant specialist in school legislation, Bureau of Education. Bulletin, 1929, No. 27.

"Secondary Education". By Carl A. Jessen, specialist in secondary education, Bureau of Education, Bulletin, 1929, No. 22.

"Publications Available September, 1929". A list of publications ready for distribution at the date given in the title.

"Statistics of Teachers Colleges and Normal Schools, 1927-1928". Prepared in the Division of Statistics by and under the supervision of Frank M. Phillips, chief, Bureau of Education. Bulletin, 1929, No. 14.

"Commercial Education, 1926-1928." By J. O. Malott, specialist in commercial education, Bureau of Education. Bulletin, 1929, No. 26.

"Certain Phases of Rural School Supervisison". Abstracts of addresses delivered at the third conference of supervisors of the southern states, held at New Orleans, La., Dec. 17 and 18, 1928. Bulletin, 1929, No. 28.

Journal of the National Education Association, October, 1929. Published by the National Education Association, Washington, D. C.

This number is full of the report of the Atlanta convention and of plans for the coming year. In addition there are numerous articles of general interest.

The Development and Use of a Composite Achievement Test. By Wendell W. Wright, professor of education, Indiana University. Bulletin of the School of Education, Indiana University, Vol. V, No. 3. Bloomington, Ind.: Indiana University.

This is a rather complete digest of the dissertation presented by Dr. Wright at Columbia University for his doctor's degree.

The Pueblo of Atlipac, Mexico

Wendell LeRoy Perkins
Associate Professor of Geography and Geology, Indiana State Teachers College

The following article was read before the meeting of the Indiana Academy of Science, Dec. 6, 7, and 8, 1928, at Indiana University, Bloomington.

It was the writer's privilege to be a member of a party, during last summer, which had for its object the study of the geography of the Valley of Mexico. To ascertain the geographic conditions which obtain in a rural community in the Valley, the Pueblo of Atlipac (Magdalena) was chosen for special study. As my time is limited I shall give only a partial resume of our findings.

The Valley of Mexico is an interior drainage basin about forty miles wide and fifty miles long, extending north and south, near the twentieth parallel of north latitude. Its altitude is nearly one and one-half miles above sea level. These factors determine the climatic conditions of summer rainfall and moderate temperatures throughout the year. Mexico City, in the center of the Valley, receives four inches of rain in June, four in July, nearly five in August, four in September, and very little rain the remainder of the year, a total of twenty to thirty inches being reported. The temperatures are not uncomfortably high in summer and are mild in winter, the mean monthly range being 67° in May to 53° in December. The nights, even in summer, are cool.

Volcanic sediments have been washed down from the mountains until the floor of the Valley is made up of deep deposits of rich soils. "Borings in the Valley of Mexico show that the depression is filled, to a minimum depth of 100 meters, with alternating deposits of sand, mud, clay, and volcanic materials." An exception to the richness of the soils should be noted, however, in the case of the salty soils bordering the shores of lakes, where cultivation is only made possible by flooding and leaching.

Atlipac is located about twelve miles southeast of Mexico City on the shore of the salt lake Texcoco. The pueblo accomodates about 150 people. The lands owned by these people embrace approximately four square miles, less than one-half of which is arable ,the remainder being either too salty, (on the north), or too rocky and steep, (on the south).

The inhabitants of Atlipac vary in race from mixtures which are predominantly Indian to individuals who are of a decidedly Spanish strain. Probably none of the residents are of pure stock, either Indian or Spanish. The senora who was the teacher in the Federal Rural School located in the pueblo possessed the most typically Spanish characteristics of anyone, her son, who was seven years old, indicating a trend toward blondness. Inter-marriage and promiscuous mingling of races, so common south of the Rio Grande, is strikingly exemplified in Atlipac.

Native homes in the pueblo, which are huddled together on a small area, are constructed commonly of adobe bricks, although some burned bricks and trap-rock, (tepetate), are in evidence, especially in the three or four best homes. The several stores are merely houses in which the front room is set aside for groceries, notions, and refreshments. Here, as elsewhere in Mexico, the homes of the peons are practically windowless. Not much by the way of furniture is to be seen. Beds are rare, the members of the family sleeping on grass mats, (petates), on the dirt floor. Cooking equipment is limited to a crude steel or stone brazero, in which charcoal is burned, a piece of sheet iron which is placed on top of the brazero for frying tortillas, one or two crude jars and a few other pieces of simple equipment. Usually one finds a rather dilapidated chest or box in one corner of the room which contains a few choice treasures such as pieces of cloth, possibly a few articles of clothing to be worn on fiesta days, and such trinkets as the family has been able to collect. Chairs are uncommon. A cheap picture of some saint or of the Virgin, with the customary candle, completes the equipment. Stark poverty lurks everywhere.

Aside from the crude houses huddled together, the few stores, the mud-walled

structure used for a jail and a "palace of justice," the Federal Rural School, (one of 3,500 now scattered throughout the Republic), and the church, attract the visitor's attention. In the brief time at my disposal I will not attempt to discuss either of these structures and the influence they exert upon the life of the community.

The southern boundary of the land owned by the people of the pueblo follows the crest of a ridge, while the northern boundary is near the midsummer shoreline of the Lago de Texcoco. The agricultural land has a gentle slope from the base of the ridge toward the lake. Unlike many land-holdings in Mexico, the land in this community is not held in common nor by an hacendado, but is owned by individuals. Five persons own as much as ten hectares, (24.71 acres), each; probably fifteen own three or four hectares each, while a large number of holdings are from one-half to one hectare. Inasmuch as those with less than three hectares must do some outside work to support their families, it is apparent that most of the people of Atlipac are poor, especially when the opportunity for outside work is limited.

The diet of the poorer Mexicans consists largely of corn and beans, always highly seasoned with peppers. Only on rare occasions can meat be provided. The dried intestines of hogs and dried worms collected from the cactus are delicacies which we better-fed meat-eaters fail to appreciate. Although he has many fruits which are not common to us, and those which are common such are peaches and apples, the Mexican uses them as they are, either fresh or as dulce (sweets), without knowing, as yet, how to check plant diseases or to produce better quality. Much of the peon's time must be spent in the raising of corn and beans, his main sources of food. His struggle with his environment to bring these plants to maturity is of especial interest.

An inadequate supply of water for the growing of his crops is one of the handicaps which the farmer of Atlipac has to face. The rainfall at best is never too plentiful, the slope of the arable land is not steep but is sufficiently pronounced to allow too much run-off, and the rate of evaporation is usually high. Many ingenious devices to distribute the water coming from the steeper slope of the ridge on the south and to prevent the rapid run-off are to be found. The two most noticeable of such inventions are, (1), a series of earth dams paralleling the base of the ridge, and, (2), a grouping of holes one to two feet in diameter and possibly three feet deep, so placed in furrows formed by contour plowing that even the heaviest rain would little more than fill them. Probably these devices were also useful in checking erosion. Several dams at the outlets of embryonic gullies along the ridge formed reservoirs for further conserving the run-off.

Plowing and cultivation of the soil are accomplished by the use of crude plows consisting of a wooden beam, a steel share fastened to a wooden piece fitted into the beam, and a single handle. Mules or burros pull the plow by a chain attached to a short pole tied to wooden saddles on the backs of the animals. A breast band of wooden fibre is fastened to either side of the saddles, extending across the breast. A plow with a heavier share is used for the first turning of the soil and one with a lighter share for further cultivation.

Corn is seldom found alone in the fields, fullest use of the land being made by planting one or both types of beans, (habas or frijoles), with the corn. Several small patches of beans alone were found on the coarser soil along the slopes, and peppers were grown alone in other small areas which might be classed as gardens. Vegetable gardens are found but are not common.

A plant commonly found in the Valley of Mexico and elsewhere on the Mesa Central, oftentimes on large haciendas devoted to its cultivation almost exclusively, is the maguey cactus. Several areas in Atlipac were set aside for this plant. It grows to a height of six to eight feet, in about seven years, when it is ready for use. The central leaves near the ground are cut out leaving a cup-like depression in which the sap gathers to the amount of several litres per day. This sap is removed by the tlachiquero, by sucking it up into a gourd, is carried to a central station in pigskin or goatskin sacks, is there emptied into kegs with some strong pulque, and within 48 hours is ready for the market in the

(Continued on Page Ninety-Six)

"Ask-Me-Another"

Questions

1. What is the average salary of all public elementary and secondary school teachers in the United States?
2. What salaries are paid in rural schools in the United States?
3. How many public elementary and secondary school teachers are there in the United States?
4. How many pupils in the public elementary schools in the United States?
5. How many students enrolled in public high schools in the United States?
6. How many students enrolled in colleges of all types both public and private?
7. How many students enrolled in teachers colleges and normal schools?
8. Do any states require more than a four-year college education for teaching in the high school?
9. Who is the president of the National Education Association?
10. How many members has the National Education Association?
11. How many of these are life members?
12. How many teachers in the United States belong to state teachers associations?
13. What per cent of the national income is spent on education?
14. What per cent of all taxes collected in the United States is spent for education?
15. How much of the increase since 1914 in the cost of education is due to increased attendance? To depreciation of the value of the dollar? To the enriched curriculum and better training of teachers?
16. How does the burden of the expenditure for public purposes of European nations compare with that of the United States?
17. Who is the secretary of the National Education Association?
18. Where and when is the next annual meeting of the National Education Association?
19. What is the purpose of the National Education Association?
20. When was the National Education Association organized?
21. How many members has the American Association of Teachers Colleges?

Answers

1. In 1926 the average salary was $1277. A conservative estimate for 1929 would be $1340.
2. The median salary for all rural school teachers in 1925 (the last year for which figures are available) was $871.
3. In 1926 there were 814,169.
4. In 1926 there were 20,984,002 pupils in public elementary schools; the 1929-30 estimate for all elementary and secondary schools is 24,000,000.
5. In 1926 there were 3,757,466 students enrolled in public high schools in the United States. Estimate for 1929-30 for all high schools is 5,000,000.
6. In 1926 there were 767,263 students enrolled in colleges.
7. In 1926 there were 270,206 students in teachers colleges and normal schools.
8. Yes—California.
9. Miss E. Ruth Pyrtle.
10. 201,715.
11. 2,798.
12. 664,779.
13. In 1926, 2.68 per cent of the national income was spent on public education and an additional .51 per cent was spent in this year on private education.
14. In 1926, 23.69 per cent was spent for public elementary and secondary education.
15. $371,901,590 or 25.3 per cent of the increase. $698,087,900 or 47.4 per cent. $402,241,510 or 27.3 per cent.
16.

Nations	Per cent of national income expended for all public purposes.
Great Britain	22.0
Norway	20.0
Italy	19.2
France	18.5
Hungary	18.0
Austria	17.3
United States	10.2

The United States is paying a smaller per cent of its income for taxes than any

other major country in the civilized world.

17. J. W. Crabtree.

18. At Columbus, Ohio from June 28 to July 4, 1930.

19. The supreme purpose of this association (N. E. A.) is the welfare of the childhood of America.

20. 1857.

21. 143 in 1927.

THE PUEBLO OF ATLIPAC, MEXICO

(Continued from Page Ninety-Four)

form of the alcoholic drink, pulque, which is drunk in great quantities by the Mexican people. Atlipac does not produce enough pulque for local consumption and imports the balance from Mexico City. The maguey plant also has other uses. The heart and the thick part of the leaves near the heart are used as floss for mats, weaving, and other processes. The tips of the leaves and the lower leaves are dried for fuel. The sharp points of the leaves are used on the roof eaves as drain pipes.

Alfalfa is being grown in Atlipac and several crops may be harvested each year. A ready market is found in Mexico City for any surplus which the farmer might have.

The salt lands along the lake, and the rocky slopes of the ridge afford pasturage for the few cattle, sheep, goats, burros, mules, and horses owned in Atlipac. To fan-boys are delegated the responsibility of watching these animals to see that they do not stray.

Manufacturing in Atlipac is almost entirely limited to part-time activities carried on by women in the homes. Broom-making, mat-weaving, and basketry are the principal industries. However, there is one individual who devotes his entire attention to a special field and that is pottery-making. The potter not only supplies Atlipac with his wares but sells neighboring pueblos as well. He is a jovial fellow, working with the crudest type of wooden sticks as tools but turns out a product which displays a type of artistiry interesting and attractive. Atlipac does not have a shoe-maker or a solderer, such artisans coming occasionally from nearby pueblos to supply Atlipac's needs. A sawmill, consisting of a cross-cut saw operated vertically by two men, and a brick kiln, both enterprises being in a state of disuse at the time of our visit, complete the manufacturing equipment of the pueblo.

Transportation to Mexico City or northeastward to Texcoco is made easy by a fairly good road, part of which is paved, and by rail over the Ferrocarrile Interoceanico. Busses and trucks operate regularly through the pueblo. Three autos are owned in Atlipac. Much of the produce sold outside must be transported on the backs of burros or in high-wheel carts drawn by mules or horses.

Mexico City is the distributing center for the Valley of Mexico and much of the region outside. There are located the wholesale houses, markets, and manufacturing institutions both large and small. Its influence is noted in Atlipac in many ways, even to the extent that some of the younger people of the pueblo find work in the city, coming back to visit their relatives at times and bringing with them city ways and city ideas.

In visiting Atlipac the geographer sees, beyond the sordid and filthy surroundings, a people whose ancestors for more than ten centuries have wrestled with their environment in order to eke out a scanty existence—who, even in their ignorance, are beholding in the meagre educational facilities which the government is now providing, the dawn of an era of better living which their children's children may enjoy.

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